

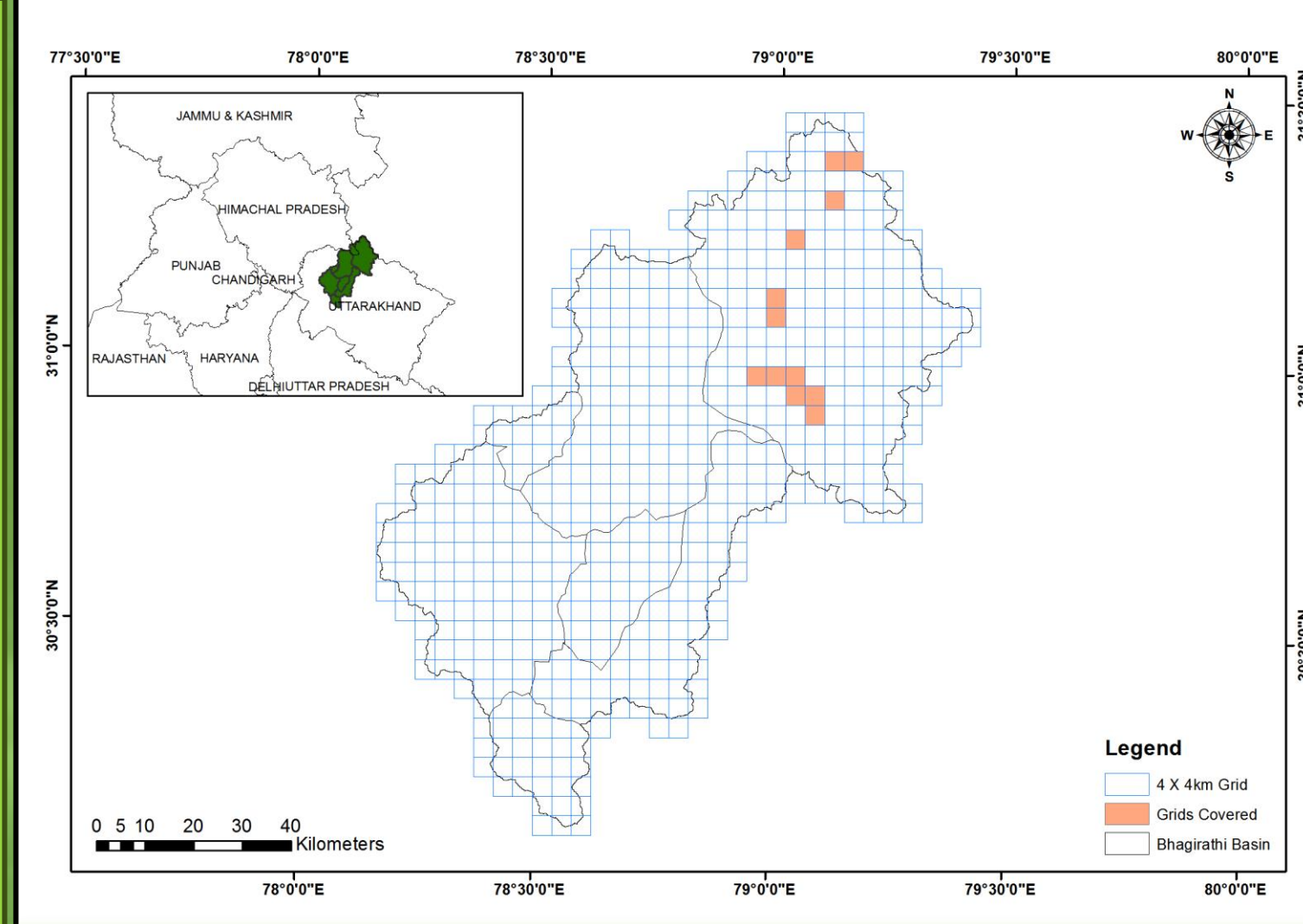
Monitoring micro-flora as climate change indicator in Indian Himalayan region (IHR)

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Background

- The Indian Himalayan Region (IHR) is considered as one of the most sensitive region for climate change
- Microflora plays a fundamental role in biogeochemical cycle of the earth, therefore maintaining the life support system
- They are important indicator of ecosystem health and important for monitoring change in their surrounding.



Map of the study area

Objective

- To determine bacterial community composition and function along elevation gradients in subalpine-alpine ecosystem.
- To determine the patterns of lichen diversity along altitudinal gradients with changing vegetation types and land use and
- To understand impacts of experimental warming on micro floral communities and habitats.

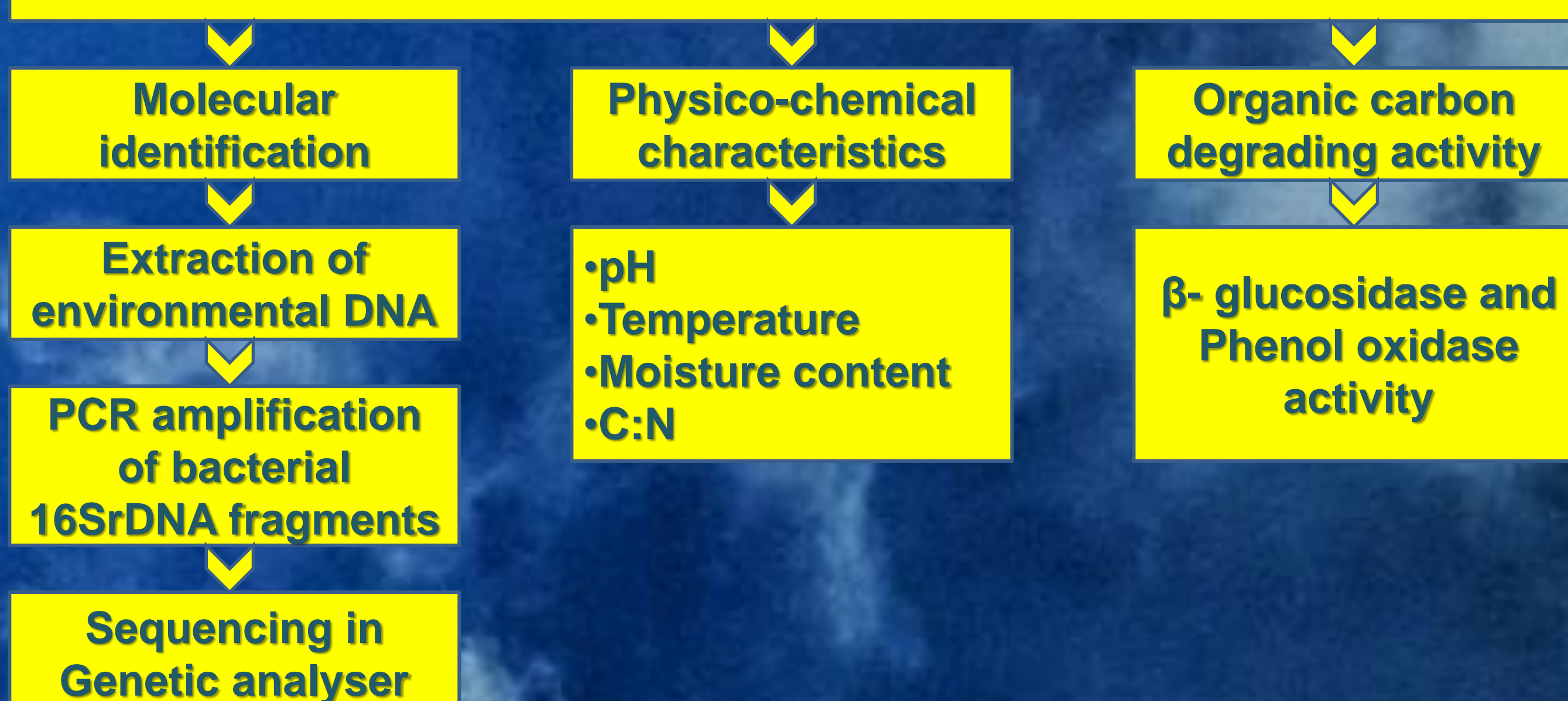
Study area

Gangotri National park in Uttarakhand (Western Himalaya)

Methodology

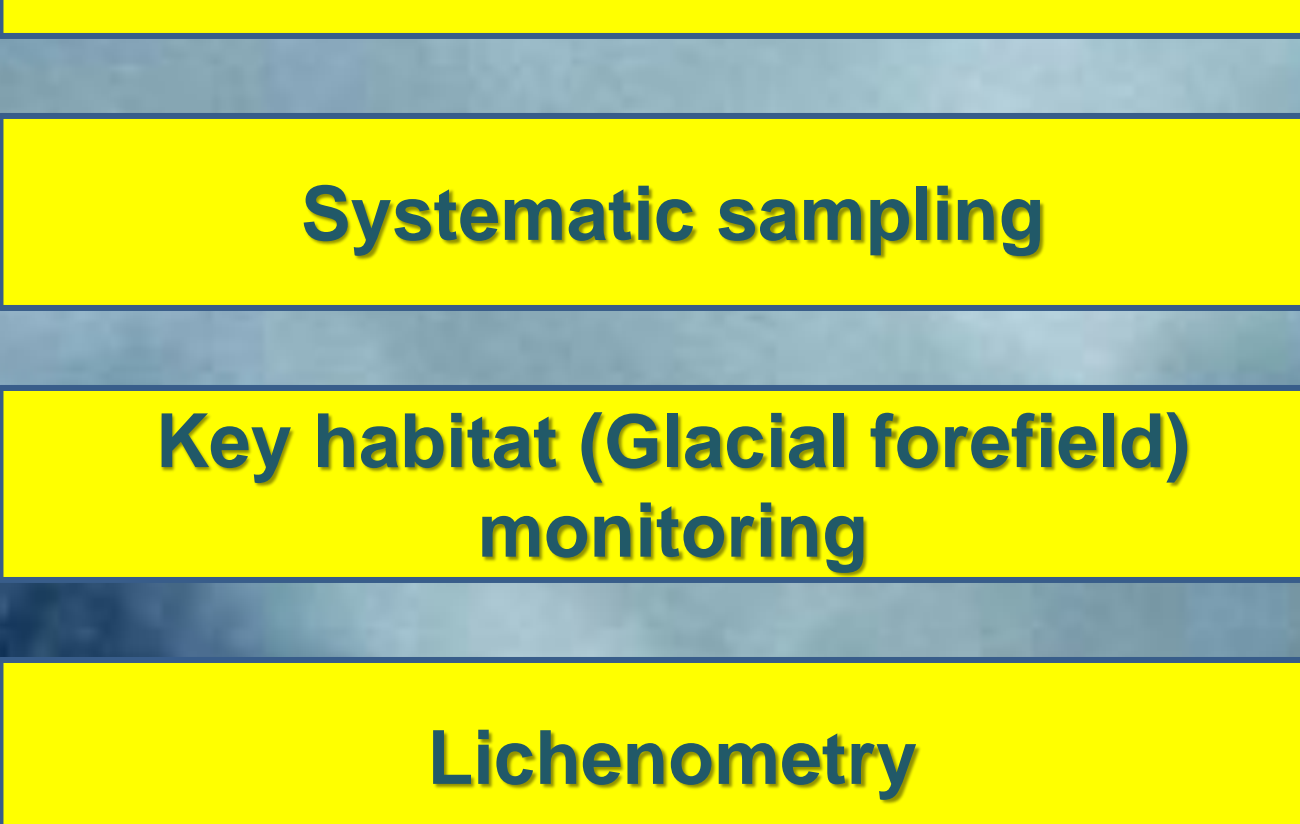
Bacteria

Microhabitat based inventories

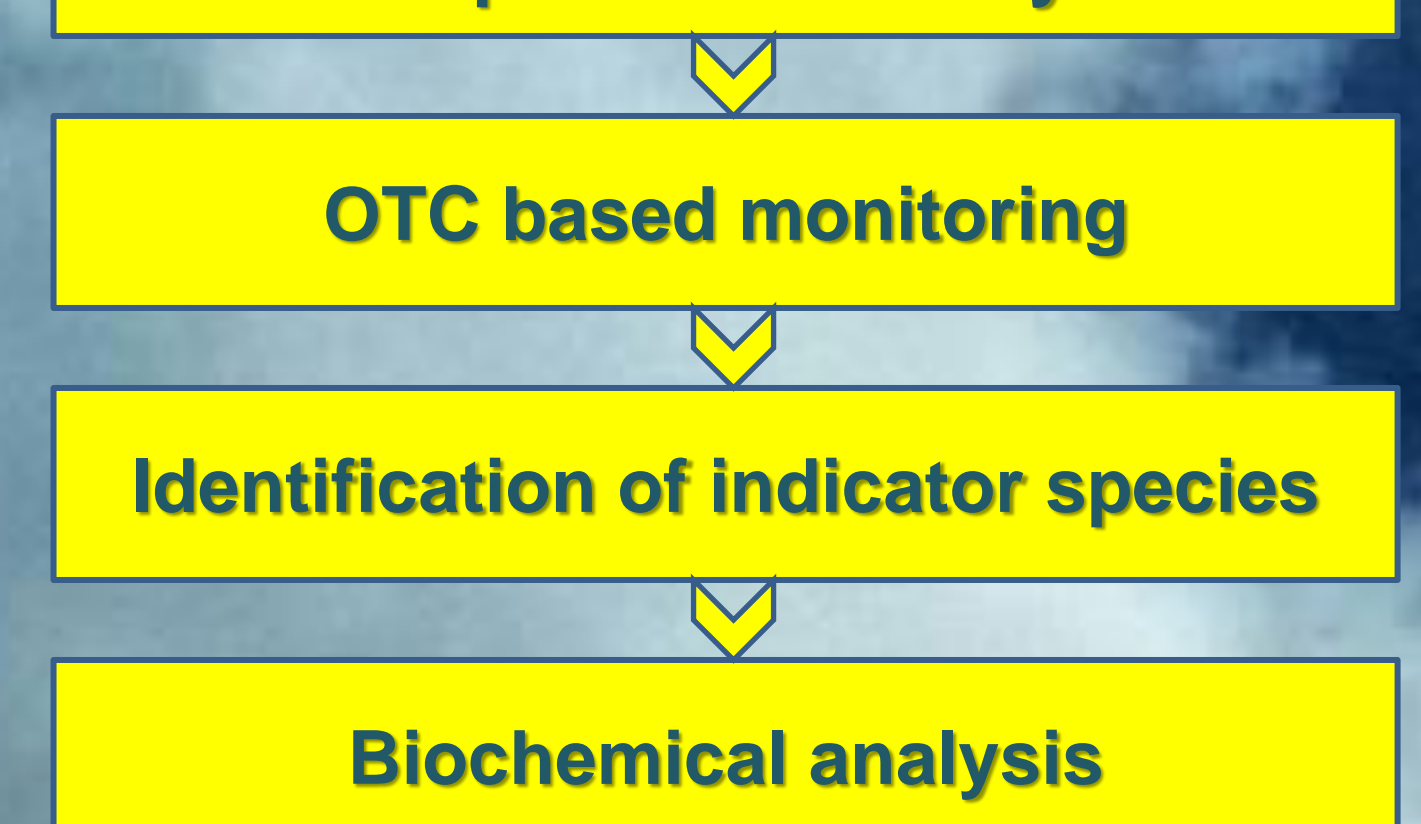


Lichen

Habitat based inventories



Experimental study



Result

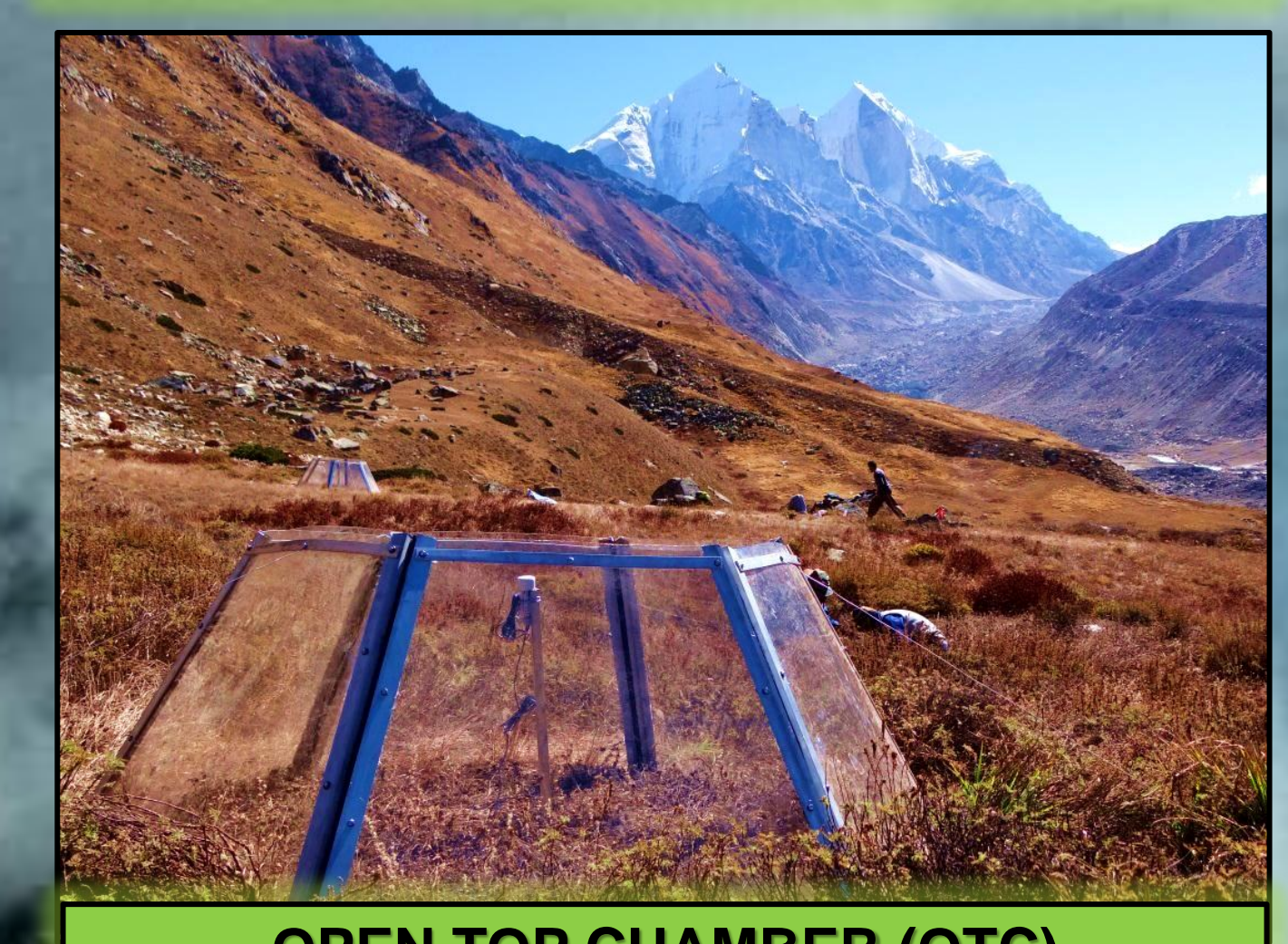
- 1200 samples of lichen were collected from the study area.
- About 100 species were identified so far belonging to 47 genera and 18 families.-
- Parmeliaceae, Physciaceae, Leconoraceae, Stereocaulaceae are the dominant families as identified.
- Two lichen species, *Rhizocarpon geographicum* and *Xanthoria elegans* were identified as focal species for Lichenometry studies.
- Soil organic carbon degrading enzyme activity such as phenol oxidase and β-glucosidase was comparatively higher in moist alpine meadows.
- 16SrDNA sequencing from these habitats identified *Proteobacteria*, *Cyanobacteria*, *Gemmatimonas*, *Actinobacteria*, *Acidobacteria spp* and few unidentified species.



LICHENOMETRY

Conclusion

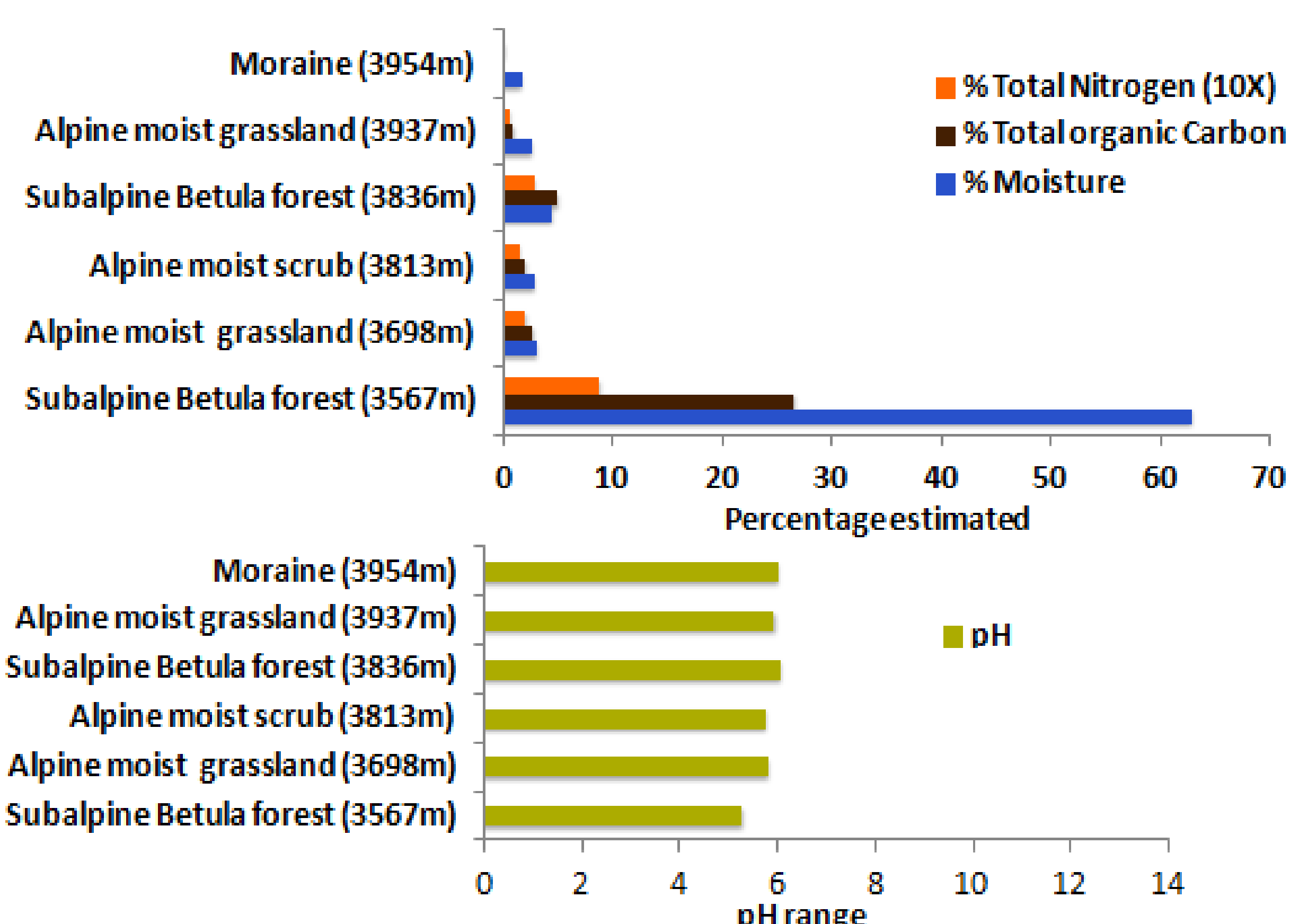
- Soil lichen richness was highest in the undisturbed habitats along the glacier forelands and decreases with increasing disturbances and land use.
- Areas along the alpine habitats were found to be ideal for long term monitoring to see change with retreating glacier in Greater and Trans-Himalayan landscape.



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Preliminary results

Soil physico-chemical properties (n=6 soils from GNP)



Future Plans

- Additional site have been selected in the Teesta basin, Sikkim. Study will be done with same approach and experimental study

Acknowledgement

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